

REMARKS

OVERVIEW

Claims 1-18 and 20-25 are pending in this application. Claim 19 has been cancelled.

The present response is in earnest effort to place the application in proper form for allowance.

AMENDMENT TO THE DRAWINGS

The Applicant has amended the drawings to include the reference numeral 11 corresponding to the substrate of the chip resistor 10. In addition, the Applicant has revised the leader line associated with reference numeral 10 for the film resistor. This amendment does not introduce any new matter. In particular, the chip resistors were originally disclosed to have a substrate (Application, page 4, last paragraph). This amendment was necessitated as given the Examiner's broad interpretation of "chip resistor" the Applicant has distinguished prior art by including that the chip resistor includes a substrate. Therefore, as "substrate" is now present in the claims, the substrate should be identified with a reference numeral in the drawings.

AMENDMENT TO THE SPECIFICATION

As the Applicant has added reference numeral 11 as indicated above in the drawings, the Applicant has amended the Specification to include reference numeral 11 associated with the disclosure of the substrate.

ISSUES UNDER 35 U.S.C. § 102(b)

The Examiner has rejected claims 1-4 under 35 U.S.C. § 102(b) as being anticipated by Hashimoto, et al. (JP 4-214601). What Hashimoto discloses in the abstract and figures is a chip resistor with resistive elements on both sides of a single substrate. Hashimoto does not disclose multiple substrates. Claim 1 has been amended to make clear that the "first and second film resistor" each have "a substrate with a top surface, a bottom surface, a first end surface, an

opposing end surface, a first side surface, and an opposing side surface” and “a film resistive element on the top surface of each substrate.” Therefore, Hashimoto does not disclose each and every limitation of claim 1 as amended. Therefore, the Examiner should now withdraw this rejection. As claims 2-4 depend from claim 1, the Examiner should now also withdraw these rejections.

The Examiner has also previously rejected claims 1-10, 13-19, 21, and 24-25 under 35 U.S.C. § 102(b) as being anticipated by U. S. Patent No. 6,311,390 to Abe, et al. Abe discloses a thermistor chip produced by using elongated strips of centered ceramic plate having a specified resistance-temperature characteristic (Abstract, Figures 2-3). The Examiner indicated in the Office Action (Paper No. 5, page 2, numbered paragraph 4) that “Moreover, no separate substrates are claimed.” The Applicant has amended independent claims 1, 9, and 18 to require that each resistor includes its own substrate and resistive element. Therefore, rejections to independent claims 1, 9, and 18 should now be withdrawn. As claims 2-8 depend from claim 1, claims 10, 13-17 depend from claim 9, claim 19 has been cancelled rendering the rejection moot, and claims 21, 24 and 25 depend from claim 18, these rejections should now be withdrawn.

The Examiner has also rejected claims 9, 12, and 13-17 under 35 U.S.C. § 102(b) as being anticipated by U. S. Patent No. 5,430,429 to Nakamura, et al. Claim 9 now requires that each “thick film resistor” includes “a substrate”, “a film resistive element” on the surface of each substrate, and “an end cap” and “a second end cap” on the ends of each substrate. Nakamura does not disclose the separate end caps of the Applicant’s claimed invention. Nakamura does disclose a plurality of resistance films 4 that can be laminated while being separated by ceramic layers (Col. 4, lines 47-53). Each of the ceramic layers does not include “an end cap” and “a

second end cap.” Therefore, this rejection should now be withdrawn. As claims 12 and 13-17 depend from claim 9, these rejections should also be withdrawn.

ISSUES UNDER 35 U.S.C. § 103(a)

The Examiner has rejected claims 5, 6, 9-15, and 18-21 under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto (4-2146010) in view of U. S. Patent No. 6,084,502 to Ariga et al. The Examiner indicated that Hashimoto disclosed the invention except the glass (Office Action, page 3, numbered paragraph 6). Claims 5-6 depend from claim 1 and claim 1 has been amended to include that the first and second film resistors each have “a substrate” and a film resistive element on the top surface of each substrate. Hashimoto fails to teach the multiple substrates of the claimed invention. Further, Ariga does not disclose the multiple substrates of the Applicant’s claimed invention. Therefore, these rejections should now appropriately be withdrawn. As claims 5 and 6 depend from claim 1 and claims 10 through 15 depend from claim 9 and claims 20-21 depend from claim 18 (claim 19 has been cancelled mooted that rejection), these rejections should also now be withdrawn as all claims require multiple substrates.

The Examiner has also rejected claims 1-8, 10-12, and 18-25 under 35 U.S.C. § 103(a) as being unpatentable over U. S. Patent No. 5,430,429 to Nakamura, et al. in view of U. S. Patent No. 3,515,958 to Claypoole, et al. The Examiner indicated that “Nakamura discloses the claimed invention except the nickel barrier.” (Office Action, page 3, numbered paragraph 7). As previously explained, claims 1, 9, and 18 include “a first and second film resistor each having (a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of each substrate, (c) an end cap on the first end surface of each surface electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface of each substrate

and electrically connected to the film resistive element.” Claypoole discloses an electrical component (a capacitor) having a body that may be formed by assembling alternate layers of metallic foil and thin sheets of glass (Col. 2, lines 33-39). Neither Claypoole nor Nakamura disclose the multiple substrates of the Applicant’s claimed invention where each substrate has a film resistive element on its top surface and is separated from another substrate by an encapsulant such as a layer of inert material such as glass. Therefore, rejection to claims 1-8, 10-12, and 18-25 should now be withdrawn.

The Examiner has also rejected claims 1-4 and 7-8 under 35 U.S.C. § 103(a) as being unpatentable over JP 6283301 in view of Hashimoto JP 4-214601. Neither Hashimoto or JP 6283301 disclose a first and second film resistor with a substrate and a film resistive element on the top surface of each substrate. Therefore, this rejection should be withdrawn and the Examiner should find these claims allowable as well.

SUMMARY

No fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Reconsideration and allowance is respectfully requested.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "John D. Goodhue", is written over a horizontal line.

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Application No. P04870US0

**AMENDMENT — VERSION WITH MARKINGS
TO SHOW CHANGES MADE**

In the Specification

Please amend page 4, paragraph 1 under “Detailed Description Of An Exemplary Embodiment as follows:

DETAILED DESCRIPTION OF AN EXEMPLARY EMBODIMENT

Figure 1 is a diagram showing an exploded view of the power chip resistor of the present invention. In Figure 1, two chip resistors 10 are shown. Each power chip may be of an internationally standard size although the present invention contemplates custom sizes as well. Each chip resistor is a thick film power chip resistor. The thick film power chip resistor has a resistive element 12. This resistive element is a thick film resistive element and preferably is ruthenium oxide. The thick film resistor preferably has an alumina substrate 11. The present invention is not limited to the particular type of film resistor and the present invention contemplates that other types of material may be used for the resistive element and for the substrate.

In the Claims

Please cancel claim 19.

Kindly amend claims 1, 2, 3, 7, 8, 9, 10, 11, 12, 16, 17, 18, 24, and 25 as follows:

1. (Amended)

A power chip resistor comprising:

~~a first film resistor having a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface;~~

~~a second film resistor having a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface;~~

a first and second film resistor each having (a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of each substrate, (c) an end cap on the first end surface and electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface and electrically connected to the film resistive element;

the second film resistor of approximately the same physical size as the first film resistor, the second film resistor of approximately the same orientation as the first film resistor; an encapsulant between the top surface of the first film resistor and the bottom surface of the second film resistor, separating the first film resistor and the second film resistor when the resistors are stacked;

a first nickel barrier connecting the end cap on the first end surface of the first film resistor and the first end surface of the second film resistor;

a second nickel barrier connecting the second end cap on the second end surface of the first film resistor and the second end cap on the second end surface of the second film resistor.

2. (Amended)

The power chip resistor of claim 2 wherein the ~~first film resistor and the second film resistor are thick film resistors.~~ film resistive elements are thick film resistive elements.

3. (Amended)

The power chip resistor of claim 1 wherein the ~~first film resistor and the second film resistor further have ruthenium oxide resistive elements.~~ film resistive elements comprise ruthenium oxide.

7. (Amended)

The power chip resistor of claim 1 further comprising:

~~a third film resistor having a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface, the third film resistor of approximately the same physical size as the second film resistor, the third film resistor of~~

~~approximately the same orientation as the second first film resistor;~~ (a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of the substrate, (c) an end cap on the first end surface electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface and electrically connected to the film resistive element;

a second encapsulant between the top surface of the substrate of the second film resistor and the bottom surface of the substrate of the third film resistor, separating the second film resistor and the third film resistor when the resistors are stacked, the first nickel barrier ~~further connecting~~ electrically connected to the end cap of the first end surface of the third film resistor, ~~with the first end surface of the first film resistor and the first end surface of the second film resistor,~~ the second nickel barrier ~~further connecting~~ electrically connected to the second end cap on the second end surface of the third film resistor ~~with the second end surface of the first film resistor and the second end surface of the second film resistor.~~

8. (Amended)

The power chip resistor of claim 7 further comprising:

a fourth film resistor having ~~a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface,~~ the fourth resistor of approximately the same physical size as the third film resistor, the fourth film resistor of ~~approximately the same orientation as the third film resistor;~~ (a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of the substrate, (c) an end cap on the first end surface electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface and electrically connected to the film resistive element;

a third encapsulant between the top surface of the substrate of the third film resistor and the bottom surface of the substrate of the fourth film resistor, separating the third film resistor and the fourth film resistor when the resistors are stacked, the first nickel barrier ~~further connecting~~ electrically connected to the end cap of the first end surface of the

~~fourth film resistor, with the first end surface of the first film resistor and the first end surface of the second film resistor and the first end surface of the third film resistor; the second nickel barrier further connecting electrically connected to the second end cap on the second end surface of the fourth film resistor with the second end surface of the first film resistor and the second end surface of the second film resistor and the second end surface of the third film resistor.~~

9. (Amended)

A power chip resistor comprising:

- ~~a first thick film resistor having a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface;~~
- ~~a second thick film resistor having a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface, the second film resistor of approximately the same physical size as the first film resistor, the second film resistor of approximately the same orientation as the first film resistor; a first and second film resistor each having (a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of each substrate, (c) an end cap on the first end surface of each surface electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface of each substrate and electrically connected to the film resistive element;~~
- a glass encapsulant between the top surface of the substrate of the first film resistor and the bottom surface of the substrate of the second film resistor for separating the first film resistor and the second film resistor when the resistors are stacked;
- a first metal barrier covering the ~~first end surface of the first film resistor and the first end surface of the second film resistor;~~ end caps on the first end surface of the substrate of the first and second film resistors;
- a second metal barrier covering the ~~second end surface of the first film resistor and the second end surface of the second film resistor;~~ second end caps on the opposing end surface of the substrate of the first and second film resistors.

10. (Amended)

The power chip resistor of 9 wherein the first and second metal barriers ~~is~~ comprise a nickel alloy.

11. (Amended)

The power chip resistor of 10 wherein the first and second metal barriers ~~is~~ comprise nickel.

12. (Amended)

The power chip resistor of claim 9 wherein ~~the first film resistor and the second film resistor further have ruthenium oxide resistive elements.~~ the film resistive elements comprise ruthenium oxide.

16. (Amended)

The power chip resistor of claim 9 further comprising:
a third ~~thick-film~~ resistor having ~~a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface, the third thick-film resistor of approximately the same physical size as the second thick-film resistor, the third thick-film resistor of approximately the same orientation as the second first thick-film resistor;~~
(a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of the substrate, (c) an end cap on the first end surface electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface and electrically connected to the film resistive element;
a second encapsulant between the top surface of the substrate of the second ~~thick-film~~ resistor and the bottom surface of the substrate of the third ~~thick-film~~ resistor, separating the second ~~thick-film~~ resistor and the third ~~thick-film~~ resistor when the resistors are stacked, the first nickel barrier ~~further connecting~~ electrically connected to the end cap of the first

~~end surface of the third thick-film resistor, with the first end surface of the first thick film resistor and the first end surface of the second thick film resistor, the second nickel barrier further connecting electrically connected to the second end cap on the second end surface of the third thick-film resistor with the second end surface of the first thick film resistor and the second end surface of the second thick film resistor.~~

17. (Amended)

The power chip resistor of claim 16 further comprising:

- a fourth thick-film resistor having (a) a substrate with a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface and an opposing side surface, (b) a film resistive element on the top surface of the substrate, (c) an end cap on the first end surface electrically connected to the film resistive element, and (d) a second end cap on the opposing end surface and electrically connected to the film resistive element; ~~a top surface, a bottom surface, a first end surface, an opposing end surface, a first side surface, and an opposing side surface, the fourth resistor of approximately the same physical size as the third thick film resistor, the fourth thick film resistor of approximately the same orientation as the third thick film resistor;~~
- a third encapsulant between the top surface of the substrate of the ~~third thick-film resistor~~ and the bottom surface of the substrate of the ~~fourth thick-film resistor~~, separating the third thick film resistor and the fourth thick-film resistor when the resistors are stacked, the first nickel barrier ~~further connecting~~ electrically connected to the end cap of the first end surface of the fourth thick-film resistor, with the first end surface of the first thick film resistor and the first end surface of the second thick film resistor and the first end surface of the third thick film resistor, the second nickel barrier further connecting electrically connected to the second end cap on the second end surface of the fourth thick-film resistor with the second end surface of the first thick film resistor and the second end surface of the second thick film resistor and the second end surface of the third thick film resistor.

18. (Amended)

A stacked chip resistor comprising:

- a first chip resistor and a second chip resistor, each chip resistor having a substrate with a thick film resistive element attached to the substrate, a first end cap and a second end cap, each end cap being an electrical terminal connected to the thick film resistive element, the first chip resistor and the second chip resistor capable of being aligned and stacked;
- a layer of glass for separating the chip resistors, the layer of glass placed between the first chip resistor and the second chip resistor;
- a first nickel barrier, the nickel barrier electrically connecting the first end cap of the first chip resistor and the ~~second~~first end cap of the second chip resistor;
- a second nickel barrier, the nickel barrier electrically connecting the second end cap of the first chip resistor and the second end cap of the second chip resistor.

24. (Amended)

The stacked chip resistor of claim 18 further comprising:

- a third chip resistor, the third chip resistor having a substrate with a thick film resistive element attached to the substrate, a first end cap and a second end cap, each end cap being an electrical terminal connected to the thick film resistive element, the third chip resistor capable of being aligned and stacked with the first chip resistor and the second chip resistor;
- a second layer of glass for separating the second chip resistor and the third chip resistor, the second layer of glass placed between the second chip resistor and the third chip resistor, the first nickel barrier electrically ~~connecting~~connected to the first end cap of the third chip resistor ~~with the first end cap of the first chip resistor and the first end cap of the second chip resistor~~, the second nickel barrier electrically ~~connecting~~connected to the second end cap of the third chip resistor ~~with the second end cap of the first chip resistor and the second end cap of the second chip resistor~~.

25. (Amended)

The stacked chip resistor of claim 24 further comprising:

- a fourth chip resistor, the fourth chip resistor having a substrate with a thick film resistive element attached to the substrate, a first end cap and a second end cap, each end cap being an electrical terminal connected to the thick film resistive element, the fourth chip resistor capable of being aligned and stacked with the first chip resistor, the second chip resistor, and the third chip resistor;
- a third layer of glass for separating the third chip resistor and the fourth chip resistor, the third layer of glass placed between the third chip resistor and the fourth chip resistor, the first nickel barrier electrically connecting the first end cap of the fourth chip resistor with the first end cap of the first chip resistor and the first end cap of the second chip resistor and the first end cap of the third chip resistor, the second nickel barrier electrically ~~connecting~~ connected to the second end cap of the fourth chip resistor ~~with the second end cap of the first chip resistor and the second end cap of the second chip resistor and the second end cap of the third chip resistor.~~

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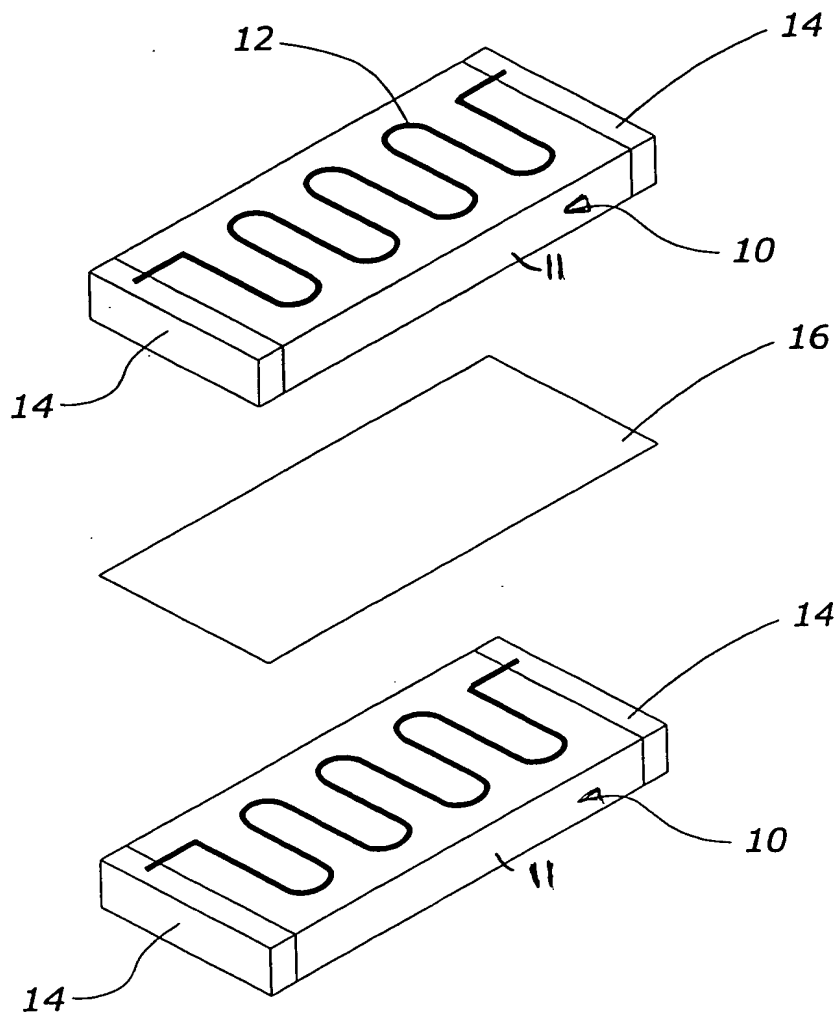


Fig. 1



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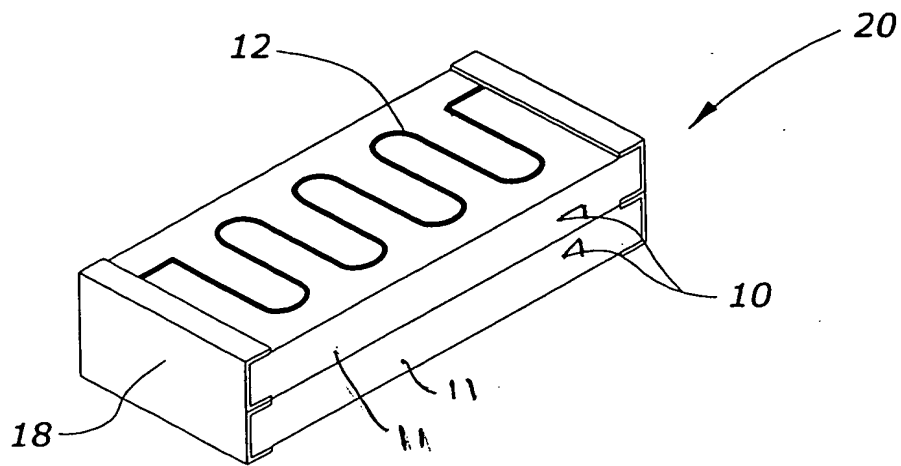


Fig. 2



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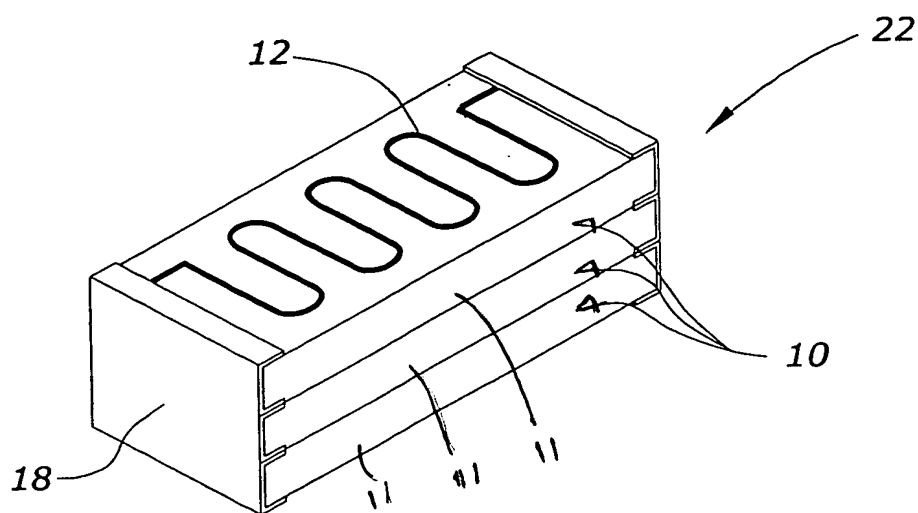


Fig. 3



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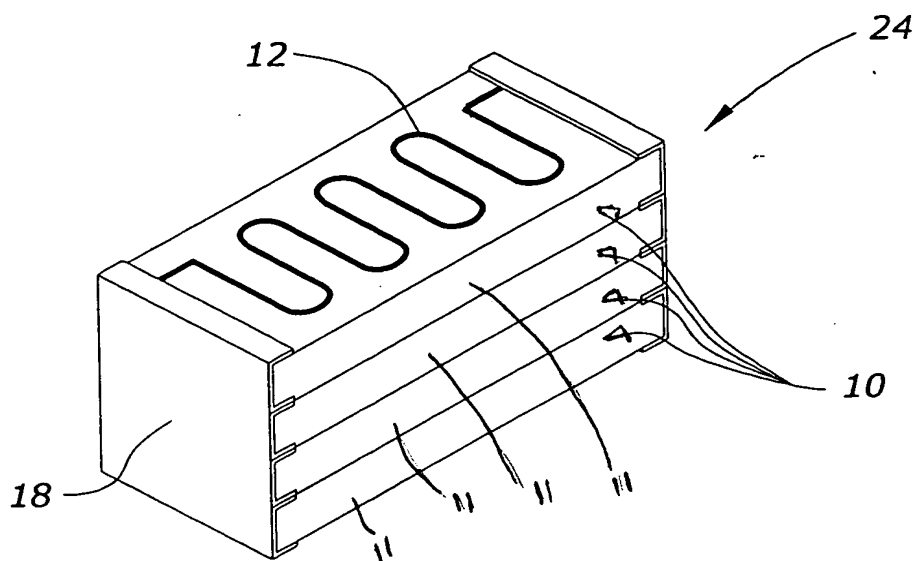


Fig. 4